

CLAIMS

1. An active matrix display device comprising a plurality of pixels arranged in a row and column array, each pixel comprising a pixel electrode (11) to which data voltages (V_d) can be supplied by an associated data conductor (12) via a respective thin film transistor (13), wherein at least a proportion of the pixels each further comprise a body (30; 70; 80) which electrically connects the associated pixel electrode to another electrode (51; 14) in response to touch-input to the pixel, said connection being detectable via the associated data conductor.

2. A device according to Claim 1, further comprising a common electrode (51) spaced from and overlying the array of pixel electrodes operable to create an electrical potential between itself and each pixel electrode, wherein each of said bodies electrically connects the associated pixel electrode to said common electrode in response to touch-input to the pixel.

3. A device according to claim 1, wherein the thin film transistor of each pixel has a gate terminal connected to an associated select conductor (14) to which gate voltages (V_g) can be applied to control the supply of data voltages to the respective pixel electrode, and wherein each of said bodies (70) electrically connects the associated pixel electrode to the associated select conductor in response to touch-input to the pixel.

4. A device according to any one of Claims 1, 2 or 3, further comprising driver circuitry connected to each data conductor, said circuitry being arranged to operate in an addressing mode for supplying data voltages to associated pixels during respective address periods (T_a), and a sensing mode for detecting touch-input to associated pixels during respective sensing periods (T_s).

5 5. A device according to Claim 4, wherein said driver circuitry comprises a respective buffer circuit (42) connected to each data conductor, each buffer circuit including an analogue to digital converter (43) serving to measure the current through the respective data conductor during said sensing period.

10 6. A touch-input responsive pixel in an active matrix display device, the pixel comprising a pixel electrode (11) to which data voltages (V_d) can be supplied by associated address circuitry which includes a respective thin film transistor (13) connected to the pixel electrode, and a body which electrically connects the pixel electrode to another electrode (51; 14) in response to touch-input to the pixel, said connection being detectable by said address circuitry.

15 7. A touch-input responsive pixel according to Claim 6, further comprising a second electrode (51) spaced from and at least partly overlying said pixel electrode, wherein said body electrically connects the pixel electrode to said second electrode in response to touch-input to the pixel.

20 8. A touch-input responsive pixel according to Claim 6, wherein the thin film transistor has a gate terminal to which gate voltages (V_g) can be applied to control the supply of data voltages to said pixel electrode, and wherein said body electrically connects the pixel electrode to said gate terminal in response to touch-input to the pixel.

25 9. A touch-input responsive pixel according to any one of Claims 6 to 8, wherein said body comprises a pressure-sensitive element (70) having an electrical resistance which changes in response to applied pressure.

30 10. A touch-input responsive pixel according to Claim 6 or Claim 8, wherein said body comprises a photoconductive element (80) having an

electrical resistance which changes in response to light of a predetermined wavelength incident thereon.

11. A touch-input responsive pixel according to any one of Claims 6
5 to 10, wherein at least part of said body overlies and directly contacts said pixel electrode.

12. A touch-input responsive pixel according to Claim 7, wherein said
body comprises a conducting material (30) and is disposed between the pixel
10 electrode and said second electrode.

13. A method of sensing touch-input to an active matrix display
device comprising a plurality of pixels each comprising a pixel electrode (11),
the method comprising the steps of:
15 - supplying data voltages (V_d) to said pixel electrodes via associated
data conductors (12) during respective address periods (T_a); and,
- measuring a signal on each of said data conductors during respective
sensing periods (T_s) to detect touch-input to the display.

20 14. A method according to Claim 13, wherein said pixels are
arranged in a row and column array and are selected one row at a time during
respective row periods (T_r) to allow data voltages on the data conductors to be
applied to the associated pixel electrodes on the selected row, and wherein
each row period comprises an address period (T_a) and a sensing period (T_s).

25 15. A method according to Claim 14, wherein each sensing period
follows an address period.

16. A method according to any one of Claims 13 to 15, wherein said
30 measuring step comprises integrating the current on each of said data
conductors for the duration of said respective sensing period.